

Application No.: 10/562,647
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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the subject application, and please amend the claims as follows:

Claim 1. (Currently amended): A robot for gripping and handling one or more objects, which robot comprises:

a stationary base with a first guide extending in a first direction,

an arm comprising a second guide extending in a second direction at an angle relative to the first direction, which arm is connected to the base by way of the first guide in such a way that the arm is movable in the first direction,

a slide which is arranged on the second guide and is movable in the second direction, wherein said first and second directions are in a common plane,

a gripper supported by the slide, for gripping one or more objects, which gripper is movable in a third direction intersecting the plane of the first and second directions,

a number of actuators provided in a stationary position on the base, for driving the arm, the slide and the gripper by means of pulling elements, which are connected to the arm, the slide and the gripper respectively, one of said actuators being connected to said arm by a pulling element for driving movement of the arm in the first direction, another one of said actuators being connected to said slide by a pulling element for driving movement of the slide in the second direction, and a third one of said actuators being connected to said gripper by a pulling element for driving movement of the gripper in the third direction,

wherein the gripper is situated in a plane extending in the second and third directions and intersecting the central longitudinal axis of the arm, and

wherein the slide has a number of pulleys for guiding drive belts, which pulleys are provided on one side relative to the plane extending in the second and third directions and intersecting the central longitudinal axis of the arm, and which pulleys can be mounted in mirror image relative to the plane.

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Claim 2. (Previously presented): The robot according to claim 1, the slide can also be mounted in the arm in an orientation wherein the slide is turned 180° about an axis in the third direction, in such a way that after the reversal of the slide the gripper is still situated in the plane extending in the second and third directions and intersecting the central longitudinal axis of the arm.

Claim 3. (Canceled)

Claim 4. (Previously presented): The robot according to claim 1, wherein the gripper has a coinciding axis of translation and axis of rotation in the third direction.

Claim 5. (Previously presented): The robot according to claim 1, wherein a first bush and a second bush are provided on the slide, which bushes are drivable by means of a separate pulling element, and in that the shaft member comprises a round shaft member projecting through the two bushes, the shaft member being provided on the periphery with cams placed in a spiral shape, the first bush being provided with a spiral-shaped groove which can interact with the cams on the shaft member in such a way that a rotation of the first bush results in a translation of the shaft member, and the second bush being provided with a straight axial groove which can interact with the cams in such a way that a rotation of the second bush results in a rotation of the shaft member.

Claims 6-7. (Canceled)

Claim 8. (Previously presented): The robot according to claim 1, wherein the robot comprises a housing which surrounds a space in which the guides, the slide, the actuators and the pulling elements are accommodated, the housing comprising a first housing part which surrounds the base and a second housing part which surrounds the arm.

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Claim 9. (Previously presented): The robot according to claim 8, wherein the first and second housing parts are made of plastic and/or stainless steel sheets.

Claim 10. (Canceled)

Claim 11. (Previously presented): The robot according to claim 1, wherein the actuators, viewed in the first direction, are distributed on the base.

Claim 12. (Previously presented): The robot according to claim 1, wherein the actuators for driving the gripper are fitted in such a way that the gripper pulling elements are of equal length.

Claim 13. (Previously presented): The robot according to claim 1, wherein the actuators are identical.

Claim 14. (Previously presented): The robot according to claim 1, wherein the actuators are provided at the same height.

Claim 15. (Previously presented): The robot according to claim 1, wherein one or more of the pulling elements and actuators are connected by means of a transmission formed by a shaft with one pulley, the pulling element in each case acting upon the one pulley, and the actuator acting on the shaft.

Claim 16. ((Previously presented): The robot according to claim 1, wherein one or more of the pulling elements and actuators are connected by means of a transmission formed by at least one shaft with a pulley which acts upon the pulling element, guide pulleys being further provided for guiding the pulling element along the pulley.

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Claim 17. (Previously presented): The robot according to claim 16, wherein the guide pulleys are arranged to slide along a line which connects the axes of the guide pulleys and are connected to a spring element in such a way that through the spring action the pulling element is tensioned by the pulleys in every operating state.

Claim 18. (Previously presented): The robot according to claim 1, wherein the base is provided on a mobile frame.

Claims 19-25. (Canceled)

Claim 26. (Previously presented): A conveyor system comprising a conveyor and a robot according to claim 1, in which the robot is designed to pick up one or more objects from the conveyor and to place the one or more objects at a location next to the conveyor.

Claim 27. (Previously presented): The conveyor system according to claim 26, which conveyor system comprises one or more conveyors disposed one behind the other and each comprising one or more robots disposed alongside the conveyor, the conveyor disposed furthest downstream being adapted to move at a lower speed of conveyance than the conveyors disposed more upstream.

Claim 28. (Previously presented): The conveyor system according to claim 26, in which the robot is connected to control means for controlling the robot, the control means comprising a speed sensor for measuring the speed of the conveyor.

Claim 29. (Previously presented): The conveyor system according to claim 28, in which the control means are provided with optical detection means for detecting the position of the one or more objects on the conveyor.

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Claim 30. (Canceled)

Claim 31. (Previously presented): The robot according to claim 1, wherein the second guide extends in the second direction at a perpendicular angle relative to the first direction, and further wherein the gripper is movable in the third direction perpendicularly intersecting the plane of the first and second directions.

Claim 32. (Previously presented): The robot according to claim 1, wherein the pulling elements include drive belts.

Claim 33. (Previously presented): The robot according to claim 15, wherein the actuator acts on the shaft by way of a transmission pulling element.

Claims 34-39. (Canceled)

Claim 40. (New): A robot for gripping and handling one or more objects, which robot comprises:

a stationary base with a first guide extending in a first direction,

an arm comprising a second guide extending in a second direction at an angle relative to the first direction, which arm is connected to the base by way of the first guide in such a way that the arm is movable in the first direction,

a slide which is arranged on the second guide and is movable in the second direction, wherein said first and second directions are in a common plane,

a gripper supported by the slide, for gripping one or more objects, which gripper is movable in a third direction intersecting the plane of the first and second directions,

a number of actuators provided in a stationary position on the base, for driving the arm, the slide and the gripper by means of pulling elements, which are connected to the arm, the

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slide and the gripper respectively, one of said actuators being connected to said arm by a pulling element for driving movement of the arm in the first direction, another one of said actuators being connected to said slide by a pulling element for driving movement of the slide in the second direction, and a third one of said actuators being connected to said gripper by a pulling element for driving movement of the gripper in the third direction, wherein the gripper is situated in a plane extending in the second and third directions and intersecting the central longitudinal axis of the arm,

wherein the actuators are provided at the same height.

Claim 41. (New): A robot for gripping and handling one or more objects, which robot comprises:

a stationary base with a first guide extending in a first direction,

an arm comprising a second guide extending in a second direction at an angle relative to the first direction, which arm is connected to the base by way of the first guide in such a way that the arm is movable in the first direction,

a slide which is arranged on the second guide and is movable in the second direction, wherein said first and second directions are in a common plane,

a gripper supported by the slide, for gripping one or more objects, which gripper is movable in a third direction intersecting the plane of the first and second directions,

a number of actuators provided in a stationary position on the base, for driving the arm, the slide and the gripper by means of pulling elements, which are connected to the arm, the slide and the gripper respectively, one of said actuators being connected to said arm by a pulling element for driving movement of the arm in the first direction, another one of said actuators being connected to said slide by a pulling element for driving movement of the slide in the second direction, and a third one of said actuators being connected to said gripper by a pulling element for driving movement of the gripper in the third direction, wherein the gripper is situated in a plane extending in the second and third directions and intersecting the central longitudinal axis of the arm,

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wherein one or more of the pulling elements and actuators are connected by means of a transmission formed by at least one shaft with a pulley which acts upon the pulling element, guide pulleys being further provided for guiding the pulling element along the pulley, and

wherein the guide pulleys are arranged to slide along a line which connects the axes of the guide pulleys and are connected to a spring element in such a way that through the spring action the pulling element is tensioned by the pulleys in every operating state.